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A VISIT TO CROWN KING MILL BY JOURNAL-MINER REPORTER

The Plant Working Splendidly and Results Obtained Satisfactory---Preparations Being Made to Start Big Tunnel.

It was the privilege of a Journal-Miner reporter during the past week to pay a visit to the Crown King mill and see the new plant in operation. The mill was started up on the 13th of July and notwithstanding the immense amount of machinery everything has worked satisfactorily from the first minute it started up. Like all mills, a few little changes and readjustments were necessary to get things in perfect working order, but there has been very little even of this to do in the Crown King mill. The plant, as it now stands, has a capacity of 100 tons per each 24 hours, but everything has been so satisfactory that the management has decided to make some additions that will increase the capacity of it to at least 150 tons per day, and a force of carpenters has already been put to work to make these additions.

The present plant was installed for the express purpose of treating the tailings dump from the old Crown King mill, but it is the intention of the company in the future to install a large stamp mill in addition to the present plant, as soon as the old tailings dump has been cleaned up, which with a mill having a capacity of 150 tons per day running at full capacity, will take over a year, there being between 50,000 and 60,000 tons of tailings in the dump.

When it is further calculated that these tailings average in value between $12 and $16 per ton something of an idea of the magnitude of this proposition alone may be had.

When the old mill on this famous property was in operation years ago they were unable to handle concentrates that went below $57.00 per ton on account of the great expense in transportation, it being necessary to pack them on burros for 50 or 60 miles over mountain trails and then to freight them for long distances before they could be shipped to the smelter for treatment. This combined with the fact that they were unable to concentrate the ore any closer with the machinery they had at that date, on account of the presence of zinc in the ore, and the expense of another concentration, will account for the values left in the tailings dump, which are a fortune in themselves, amounting in all close to $700,000.

About a year and a half ago, when it became an assured fact that the railroad would be completed to Crown King, Geo. F. Shurtleff organized a company under the name of the Crown King Mines company, for the purpose of working this old tailings dump, they believing that with the modern methods for handling this kind of a proposition, they could make a good business proposition out of it. The tailings were secured and the work of entirely remodeling the old mill and putting in the necessary new machinery was started at once and has been going ahead ever since until a few weeks ago everything was completed. In the meantime the railroad had been completed and passed within a few feet of the mill, and the plant was started as above stated.

As much of the process in use is new in this section, and some of it new to the mining industry, the Journal-Miner will give a somewhat detailed description of the workings of the plant as seen by its reporter during a stay of 24 hours at the mill.

A tunnel has been run into the tailings dump, which lies to the northwest of the mill, and in this tunnel a belt conveyor has been placed. Over the conveyor is a grizzley and on this grizzley is dumped the tailings from scrapers. It is then transferred onto another belt conveyor which carries the tailings into the top of the mill where they are dumped into bins. From these bins they are discharged into a Jeffrey dryer. This consists of seven large steel tubes about ten feet long and fifteen inches in diameter, there being seven of these tubes arranged one below the other and all connected so that the tailings pass from one to the other by gravity, there being a system of worms inside which passes the tailings from one end to the other and keeps them in constant motion. The tubes are surrounded by steam jackets which heat the inside very hot, and the vapor is drawn off by fans, and by the time the tailings have passed through this seventy feet of tubes they are dry as powder.

From the dryer they are discharged into an elevator which carries them to a trommel. The oversize passes to a grinder and is returned to the trommel until it is all ground to the desired fineness and then it is discharged into bins from where it is fed into a plunger feeder and then in a launder and thoroughly mixed with water. Two pumps then carry this pulp to the top of the mill where it is divided, if desired, for the two large Dimmick sizers. As it leaves the last pump it passes over a Pierce amalgamator which catches any particles of free gold that might be in the pulp. It then passes to the sizers.

The sizers in use in this plant are surely a marvel of construction and are the patent of one of the best concenrating men in the west, J. O. Dimmick, of Denver, who has personally installed them and is at present in charge of the concentrating department of the plant, and through his courtesy many of the details of the mill were explained to the reporter. The sizers are fourteen feet long, about ten feet high and built in a "V" shape, the material being steel. The sizing of the pulp is done by a system of drafts, currents, gates, pockets, etc., there being no screens used. The operation is based entirely on scientific principles and the results obtained from it are the absolute wonder of everyone who has seen it work. The pulp is divided into nine grades or sizes and from an overflow of water from the top something like 40 per cent. of the water is here saved and returned to the mill for use, this water being absolutely clear. At the botton of the sizer, where the pulp has settled, there are nine places to draw off the pulp and these discharge into launders which carry it to the different tables and vanners as desired. The discharge from numbers one, two, three and four is carried to Wilfley concentrating tables which concentrate the mineral in the pulp and also divides some of the iron from the zinc. The discharge from numbers five, six, seven, eight and nine is carried to the vanners for concentration. The clear iron concentrates from the four Wilfley tables are ready for the smelter when they come off the tables, carrying about three per cent. below the penalty in silica, and are worth between $45 and $60 per ton, the concentration being between three and four tons into one. This product contains 42 per cent. iron and 5 per cent. copper and is an ideal pyritic smelter product.

The zinc and iron concentrates from the four Wolfley tables and from the six vanners are carried by a worm conveyor to an elevator and by that lifted to another set of Jeffrey dryers where they are thoroughly dried as before and discharged into a large hopper from which they are fed into a Campbell pneumatic elevator and carried through this by a current of air to the roaster where the concentrates are submitted to a very short roasting process. It has been demonstrated that iron sulphides, which are not of a magnetic character, by a very short process of roasting can be changed into iron pyrrhotit, which is of a magnetic character. It is for the purpose of producing this effect that the concentrates are submitted to the roasting process. The time required is very short, being from two to five minutes after the concentrates have reached a cherry heat.

After the roasting process has been completed it is then discharged into a Campbell pneumatic cooler and carried by a very strong draft of cold air through this cooler and elevator a distance of over 100 feet, a portion of the distance the pipe passing through cold water jackets. They are finally discharged into a fire proof bin on top of the mill and there the cooling process is completed. It drops from this room into bins from which it is fed into the magnetic separators. These machines are also wonderful yet simple devices, and combined with the Dimmick sizers are the secret of the great success of the mill. These two features stand out with great prominence in the work of successfully treating the rich tailings that heretofore have been valueless because of the inability to economically and successfully extract the values from them. After the concentrates have been discharged into the separators they pass in thin layers slowly over an inclined plane just below three revolving canvass belts. Just above these belts are strongly charged magnets and as the concentrates pass over the incline plane and under the belt the magnetic iron is attracted by the magnets and lifted up to the belt. This carries it until it is from under the influence of the magnet when it is dropped into a receptacle and from there carried into a hopper where it is wheeled to the cars and ready for shipment to the smelter. The zinc and other materials that are left are caught in sacks as they leave the separator, and the zinc being from 55 to 60 per cent. pure is ready for the market and has a value of about $28 per ton.

The concentrates from the ore ran high in zinc and after freighting it to Prescott by wagon and then by rail to the smelter and paying these heavy costs it became a penalty to the extent of 50c per unit at the smelter where now, under the new conditions, it is put into a separate product and will more than pay all costs of operation.

One of the important features of the new plant is the plan for saving and reusing the water. The scarcity of water has been a great drawback to many good properties in this county and there are some wonderful properties in the Bradshaws that have suffered great loss on account of not having sufficient of this necessary fluid for running reduction works, etc., but this has not caused any trouble at the Crown King and no trouble of that kind is apprehended. The mill as it is has been saving fully 80 per cent. of the water used and it is expected to increase the saving to 90 per cent.

In conversation with General Manager George F. Shurtleff, the reporter was informed that all plans had been perfected for beginning work on the big tunnel on the property of the Crown King Mines company. In fact some of the preliminary work had been done, such as clearing away the timber and brush from the mouth of the tunnel and in a few days actual work will begin with a good force of men and the work will be driven ahead with all possible haste. This tunnel project is one of the most important that has ever been undertaken in this territory. It will start into the mountain a few feet above the railroad track about a mile north of the mill and ore bins will be built so that the ore can be dumped from the cars into the ore bins and from them loaded directly into the cars of the Bradshaw Mountain railroad and hauled to the mill.

The tunnel will be driven in at least 7,000 feet and will cross eleven full claims belonging to the company and cross cut fifteen ore veins which crop on the surface, some of them being of enormous size, running as wide as 125 feet. Some of these ledges are a continuation of the ledges on the Bradshaw Mountain copper Mining and Smelting company, which are known to be so rich and the surface indications where the big tunnel will tap them, are equal to those on the above property. The tunnel will tap these ledges at depths of from 500 to 1,500 feet, and will connect with the old workings of the Crown King Mining company at a depth of about 1,200 feet, or 500 feet below the present depth of the old shaft. This shaft will be sunk to connect with the tunnel and it is then proposed to continue the tunnel about 1,500 feet in order to tap the ledges of the Wildflower, Old Reliable, Eagles' Tail, Contention and other well proven properties and afford them an outlet for their ores through the tunnel, which will be a great transportation enterprise.

When this tunnel has been completed, which is expected to be in about a year, or by the time the old tailings dump has been cleaned up, the company will have its big stamp mill in operation for the treating of the ores of the veins that will be opened up. This mill will have a capacity of between 300 and 400 tons per day, and the richer of the ores encountered will be treated first and the big lower grade propositions will be handled by a mammoth reduction plant later on.

In substantiation of what the Journal-Miner reporter saw personally, a conversation was had with Colonel J. F. Wilson, delegate to congress from Arizona, who has lived for many years in this county and is thoroughly familiar with the conditions as they exist in the Crown King section. Col. Wilson had just returned from a two days' stay at Crown King during which time he had spent several hours at the mill watching the results very closely. When asked for his opinion as to the results as obtained in the mill he said it was simply marvelous. "Unless I am badly fooled, which I do not see how I could be," he said, "the Crown King mill is a complete success. I firmly believe that they can take any metal on earth out of the ore with that mill. It is the most complete and ingeniously constructed plant I have ever seen in my life for the purposes for which it has been constructed. The Dimmick sizers were a revelation to me. I had never dreamed that such a piece of machinery could be constructed and there can be no mistake about what it will do for it shows for itself. And the magnetic separators are the marvel of the age in mining. I make no hesitancy in saying that the mill is an unqualified success and will do all or more than has been claimed for it."

"As to the proposed tunnel project of the Crown King Mines company I think it is one of the greatest things this county and more especially the Bradshaw Mountain section could possibly have as there is no question but what it will open up a number of wonderful ledges of ore and will not only make the properties of that company among the greatest in Arizona, but will afford a splendid opportunity for several other valuable properties to market their ore at a big saving in transportation costs. That project is one that I heartily approve of and commend. I also think Mr. Shurtleff and his associates deserve great credit for the manner in which they have carried this mammoth enterprise to an assured success."

"If I had $20,000 cash to invest I do not know of a better palce in the country to invest it than this would be, and I should put every dollar of it into Crown King Mines company stock. That is the confidence I have in the company and property."

Noted Lecturer Here.

Miss Mabelle Biggart, a very talented writer and lecturer of New York, is visiting Arizona with a view of making a study of its people, its conditions and resources for the purpose of writing a series of magazine articles. In addition to being a lecturer of renown, she is also a preacher of equal renown and has occupied the pulpit in some of the most prominent churches in this country and in England. On Sunday morning she preached in the Congregationalist church in Prescott and in the evening in the Mehtodist chruch, having large congregations at each service. Miss Biggart has traveled all over the inhabited globe. She studied for the stage under Dion Bouccicault and occupies high rank as an elocutionist. She has dramatized George Eliot's wonderful story Adam Bede, and has consented to present this to a public audience on Friday evening at the Methodist church. She has given this creation of her own in many of the largest cities of the world and to the most cultivated and critical audiences and it has recieved the highest enconiums of all who have heard it. Prescott people are particularly fortunate to have an opportunity of hearing this.

A telegram from Esopus, New York, says that a report is current there that an effort will be made to have Judge Parker open his campaign with a speech at Chicago after the notification ceremonies which will be held at Rosemount. It is understood that Mayor Harrison is anxious to have Parker and Bryan on the platform together at Chicago. Thought the St. Louis convention succeeded in getting Bryan and Parker on the same platform. Perhaps Bryan slipped from it through the hole caused by the removal of the financial plank though. If Mayor Harrison could succeed in getting Bryan on that gold standard telegram with Parker, it would be quite a political achievement.

THE SURVEY OF THE TUNNEL SITE HAS BEEN AUTHORIZED

This Work Will Be Consummated at an Early Date--Mr. Fogg Hopes to Commence Construction Early Next Year.

At a meeting last Thursday evening of the citizens Black Hills tunnel committee at which all the members, except Mr. Herndon were present, Mr. Fogg outlined somewhat in detail his plans in regard to promoting this gigantic enterprise and a general discussion was had of the possibilities of success as well as of some of the possible obstacles which might be encountered. The session of the committee lasted for about two hours and at its close Mr. Fogg authorized J. J. Fisher, the well known civil engineer, to proceed at as early a date as possible and make the preliminary survey and erect the monuments necessary for the legal location of the tunnel site in accordance with the laws of the United States.

This is the first real active, practical step taken towards the building of this tunnel, previous efforts being in the nature of a preliminary reconnoisance and investigation. Having decided definitely now on a plan of action, Mr. Fogg will prosecute the work with all the energy and persistence at his command, and he hopes to be able to commence the real work of construction by the early spring.

In addition to locating the tunnel site and designating its location by the proper monuments and stakes, Mr. Fisher will take the altitudes of the various points on the surface along the line, showing the depth at which it will cut the formation and will also make a map of the surrounding country, showing the relative positions of Prescott and of Jerome and other mining camps contiguous to it as well as of the Verde valley and the approximate route for an electric line connecting Prescott with the west end of the tunnel and Jerome with the east end.

The Black Hills tunnel is now a definite, tangible enterprise, the building of which will result in greater benefits to northern Arizona and Yavapai county in particular, than any enterprise ever heretofore inaugurated and it should receive the hearty support of all citizens.

Mr. Fogg, who is the originator of this tunnel enterprise and who has undertaken the work of promoting it and of financing it, is a not only a prominent lawyer of Massachusetts but a business man of pronounced ability and great experience in the successful promotion of large enterprises. This experience, as well as the success he has achieved, will enable him to attract the attention of capital to the enterprise. He has unwavering confidence not only in the feasibility of the enterprise, but of the ultimate financial success of it when completed and will therefore be enabled to present it without any faltering or doubt on his part of its merits. So firm are his convictions in this respect that he cannot fail in its promotion, as he readily transfers this confidence to any one with whom he converses. But in addition to his own judgment in the matter, he will be backed by the favorable judgment and opinion of a score or more of the leading citizens of this county who have made a thorough and exhaustive investigation of the enterprise, and whose enthusiasm on the subject equals that of Mr. Fogg.

The mineral possibilities of the tunnel are practically unlimited cutting as it will be in a mountain range in which some of the greatest properties in Arizona are located.

Its possibilities for developing water are equally great as every indication on the surface points to the existence of a subterranean stream of water there which is forced to the surface at numerous points.

The importance of the means of traffic which it will afford by means of the proposed electric railway, even under present conditions, can scarcely be estimated while with the increased population which would result from its construction and the increase of industrial enterprises which it would promote this feature alone would make of it a paying proposition.

The water which will inevitably be obtained can be used not only for irrigation purposes but without diminishing its value for this purpose could be utilized in the generation of electricity on a large scale.

In fact the more one investigates the subject the greater its uses and benefits grow upon him.

MINING NEWS

The Phoenix Gazette, either on its own motion or on information obtained from some other source, contains the following alleged piece of news concerning the biggest mine in Arizona.: "The United Verde mine and smelter at Jerome are running full blast with nearly 1,000 men employed. One 250 ton and two 500 ton jackets are in constant operation and another 500 ton furnace will soon be put in commission. For the first six months of 1904 the United Verde mine has paid its stockholders $900,000, against $225,000 for the first six months of last year. Up to last year the company paid regular monthly dividends of 75 cents a share, which called for a disbursement of $225,000 a month upon the $3,000,000 capital of the company. The United Verde is now paying at the rate of $1,800,000 a year in dividends, besides $15,000 a year upon the $3,000,000 of debenture bonds outstanding. The United Verde has paid as high as $4,000,000 a year, most of which went to William A. Clark as owner of a very large majority of the shares. Leading engineers, however, who are familiar with the property, say that the United Verde has seen its best days, that its output is a declining one, as the higher grade ore bodies have been pretty well exhausted, other than in the "burning" section of the mine, and profits are now being derived from ore which a few years ago would have been considered too low to treat." The statement based on the testimony of "leading engineers who are familiar with the property" that the United Verde has seen its "best days" is particularly amusing. No leading mining engineer, outside of such as are employed by the company, and they are not doing any talking, has seen the inside of this great property for years, hence cannot be familiar with it and at the best could only make a guess as to its possibilities for the future. One of the best evidences that such a statement is incorrect is the fact that additional machinery is being erected for the reduction of its ore and instead of the product decreasing it is increasing and that with a reduced force of employes. The United Verde will be a big mine after the present generation has passed from earth.

The Red Rover Mining company has been incorporated in Phoenix and the property known as the Red Rover mine, situated fifty miles northeast of Phoenix, and which has for a long time been under bond to T. J. Sparks, was turned over to the new corporation. The mine has been worked in a desultory sort of way for about twenty five years. The ores are mainly copper and silver, and till recently the mine could be reached only by burro trail. The best ores were packed out on burros and shipped away to various reduction plants, no plant ever having been built at the mine. It is authoritatively stated that at least $100,000 has been taken out of the

(Continued on Page Four.)